

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the following remarks.

Before addressing the issues raised in the Official Action, the Examiner's attention is directed to the request in the second full paragraph on page six of the response originally filed on January 8, 2003 and resubmitted on January 24, 2003. As noted, it does not appear that Japanese Published Application No. 11-020649, which was applied in the first Official Action, has been made of record in this application. The Examiner is thus respectfully requested to make that document of record. *OK*

The Examiner's attention is also directed to the Information Disclosure Statement filed on November 5, 2001 citing Japanese Patent Application No. 10-281660 (Publication No. 2000-108863) and also bringing to the Examiner's attention copending Application No. 09/824,131. The Examiner is respectfully requested to return an initialed and signed copy of form PTO-1449 submitted with that Information Disclosure Statement evidencing that the Japanese document has been considered and made of record. The Examiner is also kindly asked to return a copy of the Information Disclosure Statement with initialing in the box on page two of the Information Disclosure Statement indicating that the copending application has been considered. *for 16
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again*

Finally, the Examiner's attention is directed to the Information Disclosure Statement filed on February 21, 2003. The Examiner is respectfully requested to consider and make of record the documents cited in this Information Disclosure Statement, and return an

initialed and signed copy of form PTO-1449 submitted with that Information Disclosure Statement.

Turning the Official Action, Claims 3-8, 13 and 14 have been amended without narrowing the claim scope, to address the issue raised at the top of page two of the Official Action. Accordingly, withdrawal of the claim rejection based on the second paragraph of 35 U.S.C. § 112 is respectfully requested.

The only other issue raised in the Official Action involves the rejection of Claims 2-16 on the basis of the disclosure contained in U.S. Patent No. 4,836,618 to *Wakata et al.* In view of the disclosure contained in published European Application No. 0 887 241 to *Yamaguchi et al.* That rejection is respectfully traversed for at least the following reasons.

The only independent claims currently pending in this application are Claims 2 and 9. Claim 2 is directed to a braking force distribution control device comprised of a wheel speed detecting means which detects wheel speeds of respective vehicle wheels, a road surface μ slope estimating means which, based on the detected wheel speeds, estimates road surface μ slopes for the respective wheels, and a control means which, based on the road surface μ slopes estimated for the respective wheels by the road surface μ slope estimating means, distributes braking forces to the respective wheels by controlling the braking force of each wheel. Based on the detected wheel speeds, the road surface μ slope estimating means estimates the slopes of braking forces with respect to wheel slip speeds as the road surface μ slopes for the respective wheels, and the control means controls the braking torque of a wheel which is the object of control on the basis of the road surface μ

slope of the wheel which is the object of control and the road surface μ slope of a reference wheel among the road surface μ slopes estimated by the road surface μ slope estimating means.

The Official Action correctly notes that *Wakata et al.* is deficient with respect to Claim 2 at least insofar as the disclosed brake control system does not include a road surface μ sloped estimating means which estimates for the respective wheels, based on the detected wheel speeds, the slopes of the coefficient of friction μ between the wheels and the road surface. It necessarily follows that *Wakata et al.* also does not disclose a control means which, based on the road surface μ slopes estimated for the respective wheels, distributes braking forces to the respective wheels by controlling the braking force of each wheel.

The Official Action observes that *Yamaguchi et al.* describes utilizing road surface μ slopes, rather than slip ratios, to compensate for different road surface conditions. It is true that *Yamaguchi et al.* describes calculating road surface μ gradients to estimate the road surface condition. In addition, near the bottom of page 27, *Yamaguchi et al.* describes performing stabilizing vehicle control such as VSC, ABS, TRC to provide a warning to the driver concerning the road surface condition and to estimate various vehicle conditions such as the lateral slip angle and the yaw rate.

However, what is missing in the *Yamaguchi et al.* disclosure is a description of providing a road surface μ slope estimating means which estimates the slopes of braking forces with respect to wheel slip speeds as the road surface μ slopes for the respective

wheels, and controlling the braking torque of a wheel which is the object of control based on the road surface μ slope of the wheel which is the object of control and the road surface μ slope of a reference wheel among the road surface μ slopes estimated by the road surface μ slope estimating means. While *Yamaguchi et al.* describes estimating the road surface condition using a correlation amongst a plurality of wheel motion amounts (e.g., vehicle speed, wheel speed, wheel deceleration/acceleration, slip speed, braking force, braking torque and braking pressure) which indicate road surface μ characteristics for each road surface condition, and using this correlation amongst the various wheel motion amounts to estimate the road surface condition, the *Yamaguchi et al.* disclosure is deficient in the ways noted above.

Considering at least the deficiencies pointed out above with respect to the disclosure contained in *Yamaguchi et al.*, assuming some basis exists for the modification proposed in the Official Action, the combined disclosures contained in *Wakata et al.* and *Yamaguchi et al.* would not have directed one to do that which is defined in independent Claim 2 as the invention. Accordingly, the braking force distribution control device recited in independent Claim 2 and the various dependent claims is patentably distinguishable over a combination of the disclosures contained in *Wakata et al.* and *Yamaguchi et al.*

With respect to independent Claim 9, the Official Action does not provide much discussion other than to note that *Wakata et al.* describes a brake operation detecting sensor P_m which is used to compute a target brake force. However, that is not what is defined in independent Claim 9.

As set forth in independent Claim 9, the braking force distribution control device includes, inter alia, a wheel target braking force computing means which computes target braking forces of the respective wheels on the basis of the estimated road surface μ slopes of the respective wheels and a target braking force of the vehicle, together with a braking force control means that controls the braking forces of the respective wheels based on the computed target braking forces of the respective wheels.

While it may be true that *Wakata et al.* mentions a brake operation detecting sensor Pm whose output is used to compute a target brake force, *Wakata et al.* does not describe determining a target hydraulic pressures based on estimated road surface μ slopes of the respective wheels and a target braking force of the vehicle. The disclosure in *Yamaguchi et al.* is similarly lacking in that there is no description of using the road surface μ gradients of respective wheels together with a target braking force of the vehicle to determine target braking forces of the respective wheels as set forth in independent Claim 9. It is thus submitted that the claimed braking force distribution control device recited in independent Claim 9 is also patentably distinguishable over a combination of the disclosures contained *Wakata et al.* and *Yamaguchi et al.*

Early and favorable action with respect to this application is respectfully requested.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in

resolving any remaining issues pertaining to this application, the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

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